

2026 MCAS Sample Student Work and Scoring Guide

High School Biology

Question 41: Constructed-Response

Reporting Category: Evolution

Practice Category: Evidence, Reasoning, and Modeling

Standard: [HS.LS.4.1](#) - Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence, including molecular, anatomical, and developmental similarities inherited from a common ancestor (homologies), seen through fossils and laboratory and field observations.

Item Description: Interpret a cladogram to identify the most closely related species and explain how different types of evidence can be used to determine evolutionary relatedness.

This item can be found in the released item sets on the [MCAS Resource Center](#).

Scoring Guide

Select a score point in the table below to view the sample student response.

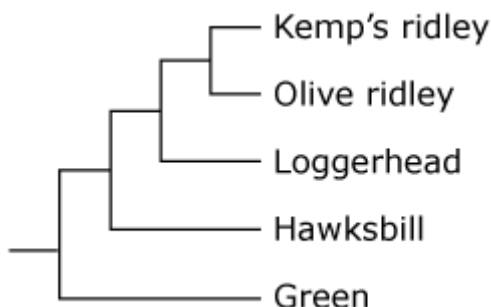
Score*	Description
4A 4B	The response demonstrates a thorough understanding of common ancestry in evolution. The response correctly identifies the two sea turtle species in the cladogram that are most closely related. The response also correctly identifies two types of evidence that scientists most likely used to create the cladogram and clearly explains how each type of evidence can be used by scientists to determine the relatedness of sea turtles.
3	The response demonstrates a general understanding of common ancestry in evolution.
2	The response demonstrates a limited understanding of common ancestry in evolution.
1	The response demonstrates a minimal understanding of common ancestry in evolution.
0	The response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.

*Letters are used to distinguish between sample student responses that earned the same score (e.g., 4A and 4B).

Score Point 4A

This question has three parts.

Five species of sea turtles share a common ancestor, as shown in the cladogram. The cladogram was created using different types of scientific evidence.

**Part A**

Based on the cladogram, identify the two sea turtle species that are most closely related.

The two sea turtle species are the Kemp's ridley and the Olive ridley.

Part B

Identify one type of evidence that scientists most likely used to create the cladogram. Explain how the evidence can be used by scientists to determine the relatedness of sea turtles.

One type of evidence the scientists most likely used was comparing the amino acid sequence of a protein in the different sea turtles. The more similar these sequences are for this specific protein, the more likely that these sea turtles share a more recent common ancestor.

Part C

Identify **another** type of evidence that scientists most likely used to create the cladogram. Explain how the evidence can be used by scientists to determine the relatedness of sea turtles.

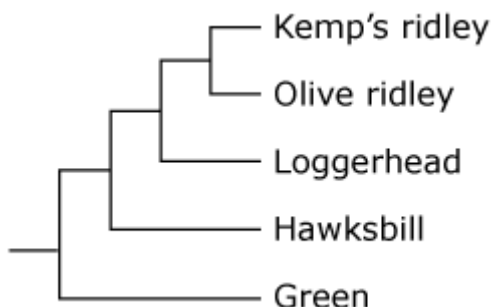
Another type of evidence the scientists could have used is comparing the homologous structures of the sea turtles. The more similar these homologous structures are, the more likely that these sea turtles are related.

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Score Point 4B

This question has three parts.

Five species of sea turtles share a common ancestor, as shown in the cladogram. The cladogram was created using different types of scientific evidence.

**Part A**

Based on the cladogram, identify the two sea turtle species that are most closely related.

Kemp's ridley and Olive ridley are the most closely related species.

Part B

Identify one type of evidence that scientists most likely used to create the cladogram. Explain how the evidence can be used by scientists to determine the relatedness of sea turtles.

One type of evidence they could have used is DNA, and see which of their DNAs were most similar, meaning that they are more closely related.

Part C

Identify **another** type of evidence that scientists most likely used to create the cladogram. Explain how the evidence can be used by scientists to determine the relatedness of sea turtles.

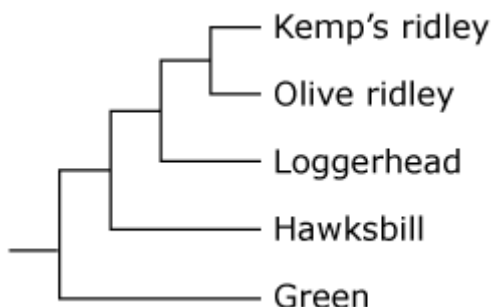
Another type of evidence they could have used is fossils/skeletal structures and compare how similar each of their fossils/skeletons are to each other, which then can be used to determine their relatedness (more similar meaning more closely related).

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Score Point 3

This question has three parts.

Five species of sea turtles share a common ancestor, as shown in the cladogram. The cladogram was created using different types of scientific evidence.

**Part A**

Based on the cladogram, identify the two sea turtle species that are most closely related.

The Kemp's ridley and the Olive ridley

Part B

Identify one type of evidence that scientists most likely used to create the cladogram. Explain how the evidence can be used by scientists to determine the relatedness of sea turtles.

The fossil record because they can identify homologous structures in the bones and see the change over time between the species.

Part C

Identify **another** type of evidence that scientists most likely used to create the cladogram. Explain how the evidence can be used by scientists to determine the relatedness of sea turtles.

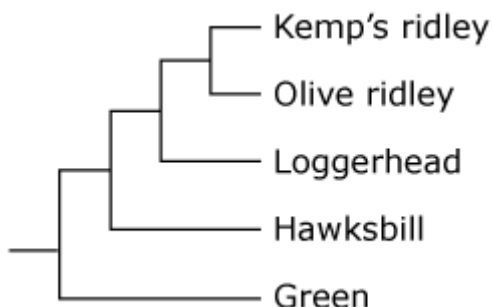
Amino acid/DNA sequencing because they can read how far off the amino acid sequence between each species is to determine how closely related they are, the less off they are from each other the more closely related they are.

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Score Point 2

This question has three parts.

Five species of sea turtles share a common ancestor, as shown in the cladogram. The cladogram was created using different types of scientific evidence.

**Part A**

Based on the cladogram, identify the two sea turtle species that are most closely related.

The two species that are most likely related are the kemp's ridley and the olive ridley.

Part B

Identify one type of evidence that scientists most likely used to create the cladogram. Explain how the evidence can be used by scientists to determine the relatedness of sea turtles.

Scientists most likely looked at the bone structure of the sea turtles to determine the relatedness.

Part C

Identify **another** type of evidence that scientists most likely used to create the cladogram. Explain how the evidence can be used by scientists to determine the relatedness of sea turtles.

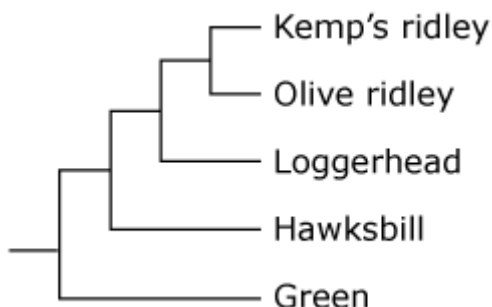
Scientists also most likely looked at the sea turtles DNA and compared them with one another.

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Score Point 1

This question has three parts.

Five species of sea turtles share a common ancestor, as shown in the cladogram. The cladogram was created using different types of scientific evidence.

**Part A**

Based on the cladogram, identify the two sea turtle species that are most closely related.

Kemp's ridley and Olive ridley because they are coming off of the same branch.

Part B

Identify one type of evidence that scientists most likely used to create the cladogram. Explain how the evidence can be used by scientists to determine the relatedness of sea turtles.

They probably used how similar the turtles looked to each other. The scientists can use that evidence to explain the different features or similarities the turtles have.

Part C

Identify **another** type of evidence that scientists most likely used to create the cladogram. Explain how the evidence can be used by scientists to determine the relatedness of sea turtles.

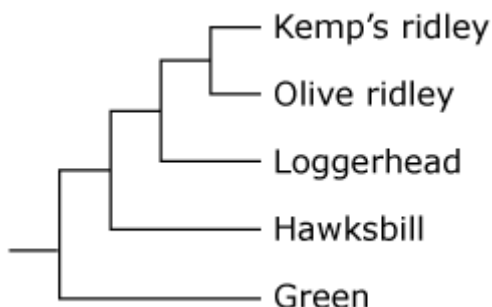
They might have used common ancestry. The scientists could have noticed that the turtles have some things that were alike and realized that they could come from common ancestors.

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Score Point 0

This question has three parts.

Five species of sea turtles share a common ancestor, as shown in the cladogram. The cladogram was created using different types of scientific evidence.

**Part A**

Based on the cladogram, identify the two sea turtle species that are most closely related.

The loggerhead and the green are most likely related to the turtle because they have many common ancestors with all those animals.

Part B

Identify one type of evidence that scientists most likely used to create the cladogram. Explain how the evidence can be used by scientists to determine the relatedness of sea turtles.

One type of evidence is most likely the looks of the animal and how the animal adapts into the environment because its very important to see the simalarities between animals.

Part C

Identify **another** type of evidence that scientists most likely used to create the cladogram. Explain how the evidence can be used by scientists to determine the relatedness of sea turtles.

another piece of evidence would be the different shades of colors of the related animals to see how close of a shade do those animals have to the sea turtles.

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